

A Review Analysis of Ancient Greek Architecture

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Abstract

The architecture of Ancient Greece is the architecture produced by the Greek-speaking people (Hellenic people) whose culture flourished on the Greek mainland and Peloponnesus, the Aegean Islands, and in colonies in Asia Minor and Italy for a period from about 900 BC until the 1st century AD, with the earliest remaining architectural works dating from around 600 BC. Ancient Greek architecture is best known from its temples, many of which are found throughout the region, mostly as ruins but many substantially intact. The second important type of building that survives all over the Hellenic world is the open-air theatre, with the earliest dating from around 350 BC. Other architectural forms that are still in evidence are the processional gateway (propylon), the public square (agora) surrounded by storied colonnade (stoa), the town council building (bouleuterion), the public monument, the monumental tomb (mausoleum) and the stadium.

Keywords: Greek architecture, Ancient Greece.

INTRODUCTION

Ancient Greek architecture is distinguished by its highly formalised characteristics, both of structure and decoration. This is particularly so in the case of temples where each building appears to have been conceived as a sculptural entity within the landscape, most often raised on high ground so that the elegance of its proportions and the effects of light on its surfaces might be viewed from all angles. Nikolaus Pevsner refers to "the plastic shape of the [Greek] temple.....placed before us with a physical presence more intense, more alive than that of any later building". The formal vocabulary of Ancient Greek architecture, in particular the division of architectural style into three defined orders: the Doric Order, the Ionic Order and the Corinthian Order, was to have profound effect on Western architecture of later periods. The architecture of Ancient Rome grew out of that of Greece and maintained its influence in Italy unbroken until the present day. From the Renaissance, revivals of Classicism have kept alive not only the precise forms and ordered details of Greek architecture, but also its concept of architectural beauty based on balance and proportion. The successive styles of Neoclassical architecture and Greek Revival architecture followed and adapted Ancient Greek styles closely



INFLUENCES

Geography

The mainland and islands of Greece are rocky, with deeply indented coastline, and rugged mountain ranges with few substantial forests. The most freely available building material is stone. Limestone was readily available and easily worked. There is an abundance of high quality white marble both on the mainland and islands, particularly Paros and Naxos. This finely grained material was a major contributing factor to precision of detail, both architectural and sculptural, that adorned Ancient Greek architecture. Deposits of high quality potter's clay were found throughout Greece and the Islands, with major deposits near Athens. It was used not only for pottery vessels, but also roof tiles and architectural decoration.

The climate of Greece is maritime, with both the coldness of winter and the heat of summer tempered by sea breezes. This led to a lifestyle where many activities took place outdoors. Hence temples were placed on hilltops, their exteriors designed as a visual focus of gatherings and processions, while theatres were often an enhancement of a naturally occurring sloping site where people could sit, rather than a containing structure.

Colonnades encircling buildings, or surrounding courtyards provided shelter from the sun and from sudden winter storms.



The rugged indented coastline at Rhamnous, Attica



The Acropolis, Athens, is high above the city on a natural prominence.



The Theatre and Temple of Apollo in mountainous country at Delphi



The Islands of the Aegean from Cape Sounion

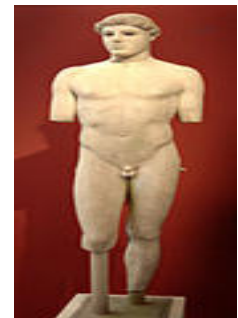
HISTORY

The history of the Ancient Greek civilization is divided into two eras, the Hellenic and the Hellenistic. The Hellenic period commenced circa 900 BC (with substantial works of architecture appearing from about 600 BC), and ended with the death of Alexander the Great in 323 BC. During the Hellenistic period, 323 BC - AD 30, Hellenic culture was spread widely, firstly throughout lands conquered by Alexander, and then by the Roman Empire which absorbed much of Greek culture. Prior to the Hellenic era, two civilizations had existed within the region, the Minoan and the Mycenaean. Minoan is the name given by modern historians to the people of ancient Crete (c. 2800–1100 BC), known for their elaborate and richly decorated palaces, and for their pottery painted with floral and marine motifs. The Mycenaean culture occurred on the Peloponnesus (c.1500–1100 BC) and was quite different in character, building citadels, fortifications and tombs rather than palaces, and decorating their pottery with bands of marching soldiers rather than octopus and seaweed. Both these civilizations came to an end around 1100 BC, that of Crete possibly because of volcanic devastation, and that of Mycenae because of invasion from Dorian people of the Greek mainland. This led to a period with few remaining signs of culture, and thus often referred to as a Dark Age.

The art history of the Hellenic era is generally subdivided into four periods, the Protogeometric (1100-900 BC), the Geometric (900-700 BC), the Archaic (700 - 500 BC) and the Classical (500 - 323



BC) with sculpture being further divided into Severe Classical, High Classical and Late Classical. The first signs of the particular artistic character that defines Ancient Greek architecture are to be seen in the pottery of the Dorian Greeks from the 10th century BC. Already at this period it is created with a sense of proportion, symmetry and balance not apparent in similar pottery from Crete and Mycenae. The decoration is precisely geometric, and ordered neatly into zones on defined areas of each vessel. These qualities were to manifest themselves not only through a millennium of Greek pottery making, but also in the architecture that was to emerge in the 6th century.



RELIGION AND PHILOSOPHY



Left : Modern model of ancient Olympia with the Temple of Zeus at the centre

Right: Recreation of the colossal statue of Athena, once housed in the Parthenon, with sculptor Alan LeQuire



The religion of Ancient Greece was a form of nature worship that grew out of the beliefs of earlier cultures. However, unlike earlier cultures, man was no longer perceived as being threatened by nature, but as its sublime product. The natural elements were personified as gods of completely human form, and very human behaviour. The home of the gods was thought to be Olympus, the highest mountain in Greece. The most important deities were: Zeus, the supreme god and ruler of the sky; Hera, his wife and goddess of marriage; Athena, goddess of wisdom; Poseidon, god of the sea; Demeter, goddess of the earth; Apollo, god of the sun, law, reason, music and poetry; Artemis, goddess of the moon, the hunt and the wilderness; Aphrodite, goddess of love; Ares, God of war; Hermes, god of commerce and medicine, and Hephaestus, god of fire and metalwork. Worship, like many other activities, was done in community, in the open. However, by 600 BC, the gods were often represented by large statues and it was necessary to provide a building in which each of these could be housed. This led to the development of temples.

ARCHITECTURAL CHARACTER

Early development

There is a clear division between the architecture of the preceding Mycenaean culture and Minoan cultures and that of the Ancient Greeks, the techniques and an understanding of their style being lost when these civilizations fell. The Minoan architecture of Crete, was of trabeated form like that of Ancient Greece. It employed wooden columns with capitals, but the columns were of very different form to Doric columns, being narrow at the base and splaying upward. The earliest forms of columns in Greece seem to have developed independently. As with Minoan architecture, Ancient Greek domestic architecture centred on open spaces or courtyards surrounded by colonnades. This form was adapted to the construction of hypostyle halls within the larger temples.

Types of buildings

The rectangular temple is the most common and best-known form of Greek public architecture. The temple did not serve the same function as a modern church, since the altar stood under the open sky in the temenos or sacred precinct, often directly before the temple. Temples served as the location of a cult image and as a storage place or strong room for the treasury associated with the cult of the god in question, and as a place for devotees of the god to leave their votive offerings, such as statues, helmets and weapons. Some Greek temples appear to have been oriented astronomically. The temple was generally part of a religious precinct known as the acropolis. According to Aristotle, "the site should be a spot seen far and wide, which gives good elevation to virtue and towers over the neighbourhood". Small circular temples, tholos were also constructed, as well as small temple-like buildings that served as treasuries for specific groups of donors.



Porta Rosa, a street (3rd century BCE) Velia, Italy



The reconstructed Stoa of Attalos, the Agora, Athens



The Bouleuterion, at Priene



The Stadium at Epidauros

During the late 5th and 4th centuries BC, town planning became an important consideration of Greek builders, with towns such as Paestum and Priene being laid out with a regular grid of paved streets and an agora or central market place surrounded by a colonnade or stoa. The completely restored Stoa of Attalos can be seen in Athens. Towns were also equipped with a public fountain where water could be collected for household use. The development of regular town plans is associated with Hippodamus of Miletus, a pupil of Pythagoras.

Greek towns of substantial size also had a palaestra or a gymnasium, the social centre for male citizens which included spectator areas, baths, toilets and club rooms. Other buildings associated with sports include the hippodrome for horse racing, of which only remnants have survived, and the stadium for foot racing, 600 feet in length, of which examples exist at Olympia, Delphi, Epidaurus and Ephesus, while the Panathinaiko Stadium in Athens, which seats 45,000 people, was restored in the 19th century and was used in the 1896, 1906 and 2004 Olympic Games.



The Palaestra at Olympia, used for boxing and wrestling



Pebble mosaic floor of a house at Olynthos, depicting Bellerophon



Theatre of Dionysus, Athens

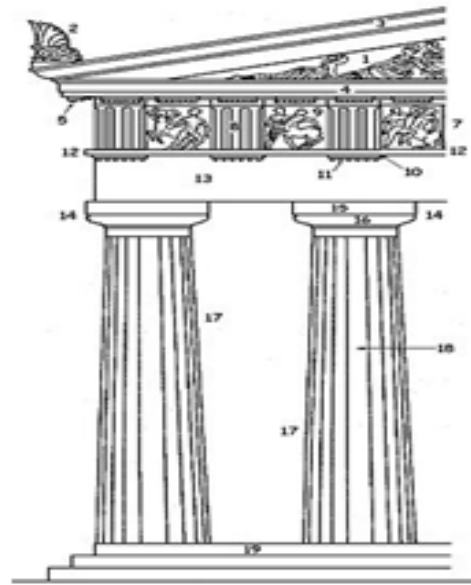


The Altar of Hiero II at Syracuse

STRUCTURE

Column and lintel

The architecture of Ancient Greece is of a trabeated or "post and lintel" form, i.e. it is composed of upright beams (posts) supporting horizontal beams (lintels). Although the existent buildings of the era are constructed in stone, it is clear that the origin of the style lies in simple wooden structures, with vertical posts supporting beams which carried a ridged roof. The posts and beams divided the walls into regular compartments which could be left as openings, or filled with sun dried bricks, lathes or straw and covered with clay daub or plaster. Alternately, the spaces might be filled with rubble. It is likely that many early houses and temples were constructed with an open porch or "pronaos" above which rose a low pitched gable or pediment. The stone columns are made of a series of solid stone cylinders or "drums" that rest on each other without mortar, but were sometimes centred with a bronze pin. The columns are wider at the base than at the top, tapering with an outward curve known as "entasis". Each column has a capital of two parts, the upper, on which rests the lintels, being square and called the "abacus". The part of the capital that rises from the column itself is called the "echinus". It differs according to the order, being plain in the Doric Order, fluted in the Ionic and foliate in the Corinthian. Doric and usually Ionic capitals are cut with vertical grooves known as "fluting". This fluting or grooving of the columns is a retention of an element of the original wooden architecture.



Entablature and pediment

The columns of a temple support a structure that rises in two main stages, the entablature and the pediment. The entablature is the major horizontal structural element supporting the roof and encircling the entire building. It is composed of three parts. Resting on the columns is the architrave made of a series of stone "lintels" that spanned the space between the columns, and meet each other at a joint directly above the centre of each column.

Masonry

Every temple rested on a masonry base called the crepidoma, generally of three steps, of which the upper one which carried the columns was the stylobate. Masonry walls were employed for temples from about 600 BC onwards. Masonry of all types was used for Ancient Greek buildings, including rubble, but the finest ashlar masonry was usually employed for temple walls, in regular courses and large sizes to minimise the joints. The blocks were rough hewn and hauled from quarries to be cut and bedded very precisely, with mortar hardly ever being used. Blocks, particularly those of columns and parts of the building bearing loads were sometimes fixed in place or reinforced with iron clamps, dowels and rods of wood, bronze or iron fixed in lead to minimise corrosion.

Openings

Door and window openings were spanned with a lintel, which in a stone building limited the possible width of the opening. The distance between columns was similarly affected by the nature of the lintel, columns on the exterior of buildings and carrying stone lintels being closer together than those on the interior, which carried wooden lintels. Door and window openings narrowed towards the top. Temples were constructed without windows, the light to the naos entering through the door. It has been suggested that some temples were lit from openings in the roof. A door of the Ionic Order at the Erechtheion, (17 feet high and 7.5 feet wide at the top), retains many of its features intact, including mouldings, and an entablature supported on console brackets. (See Architectural Decoration, below).

Structure, masonry, openings and roof of Greek temples



The Parthenon, shows the common structural features of Ancient Greek architecture: crepidoma, columns, entablature, pediment.



Temple of Hephaestos, fluted Doric columns with abacuses supporting double beams of the architrave



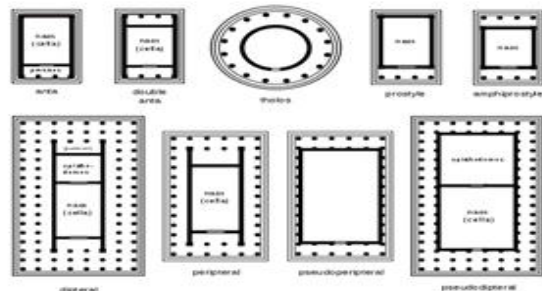
Erechtheion: masonry, door, stone lintels, coffered ceiling panels



At the Temple of Aphaia the hypostyle columns rise in two tiers, to a height greater than the walls, to support a roof without struts.

Roof: The widest span of a temple roof was across the cella, or internal space. In a large building, this space contains columns to support the roof, the architectural form being known as hypostyle. It appears that, although the architecture of Ancient Greece was initially of wooden construction, the early builders did not have the concept of the diagonal truss as a stabilising member. This is evidenced by the nature of temple construction in the 6th century BC, where the rows of columns supporting the roof the cella rise higher than the outer walls, unnecessary if roof trusses are employed as an integral part of the wooden roof. The indication is that initially all the rafters were supported directly by the entablature, walls and hypostyle, rather than on a trussed wooden frame, which came into use in Greek architecture only in the 3rd century BC.

Temple plans: Most Ancient Greek temples were rectangular, and were approximately twice as long as they were wide, with some notable exceptions such as the enormous Temple of Zeus Olympus in Athens with a length of nearly 2 1/2 times its width. The majority of Temples were small, being 30–100 feet long, while a few were large, being over 300 feet long and 150 feet wide. The iconic Parthenon on the Athenian Acropolis occupies a midpoint at 235 feet long by 109 feet wide. A number of surviving temple-like structures are circular, and are referred to as tholos. The entasis is never sufficiently pronounced as to make the swelling wider than the base; it is controlled by a slight reduction in the rate of decrease of diameter.



The main lines of the Parthenon are all curved.

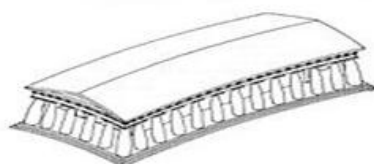
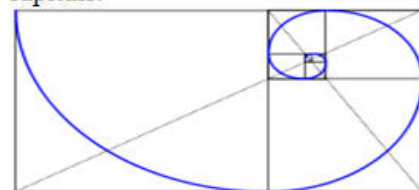


Diagram showing the optical corrections made by the architects of the Parthenon



A sectioned nautilus shell. These shells may have provided inspiration for voluted Ionic capitals.



The growth of the nautilus corresponds to the Golden Mean

The Parthenon, the Temple to the Goddess Athena on the Acropolis in Athens, is the epitome of what Nikolaus Pevsner called "the most perfect example ever achieved of architecture finding its fulfilment in bodily beauty".

Helen Gardner refers to its "unsurpassable excellence", to be surveyed, studied and emulated by architects of later ages. Yet, as Gardner points out, there is hardly a straight line in the building. Banister Fletcher calculated that the stylobate curves upward so that its centres at either end rise about 2.6 inches above the outer corners, and 4.3 inches on the longer sides. A slightly greater adjustment has been made to the entablature. The columns at the ends of the building are not vertical but are inclined towards the centre, with those at the corners being out of plumb by about 2.6 inches. These outer columns are both slightly wider than their neighbours and are slightly closer than any of the others.

STYLE

Orders of Ancient Greek architecture



volute and ornamented echinus

left: Architectural elements of the Doric Order showing simple curved echinus of capital



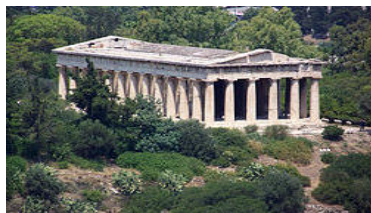
above: Capital of the Corinthian Order showing foliate decoration and vertical volutes

above: Capital of the Ionic Order showing

Orders Stylistically, Ancient Greek architecture is divided into three "orders": the Doric Order, the Ionic Order and the Corinthian Order, the names reflecting their origins. While the three orders are most easily recognizable by their capitals, the orders also governed the form, proportions, details and relationships of the columns, entablature, pediment and the stylobate.

Doric Order Doric order is recognised by its capital, of which the echinus is like a circular cushion rising from the top of the column to the square abacus on which rest the lintels. The echinus appears flat and splayed in early examples, deeper and with greater curve in later, more refined examples, and smaller and straight-sided in Hellenistic examples. A refinement of the Doric Column is the entasis, a gentle convex swelling to the profile of the column, which prevents an optical illusion of concavity.

The Temple of Hephaestos, Athens, is a well-preserved temple of peripteral hexastyle plan.



The tapered fluted columns, constructed in drums, rest directly on the stylobate

The entablature showing the architrave, frieze with triglyphs and metopes and the overhanging cornice. The Doric entablature is in three parts, the architrave, the frieze and the cornice. The architrave is composed of the stone lintels which span the space between the columns, with a joint occurring above the centre of each abacus.

On this rests the frieze, one of the major areas of sculptural decoration. The frieze is divided into triglyphs and metopes, the triglyphs, as stated elsewhere in this article, are a reminder of the timber history of the architectural style. Each triglyph has three vertical grooves, similar to the columnar fluting, and below them, seemingly connected, are small strips that appear to connect the triglyphs to the architrave below. A triglyph is located above the centre of each capital, and above the centre of each lintel. However, at the corners of the building, the triglyphs do not fall over the centre the column. The ancient architects took a pragmatic approach to the apparent "rules", simply extending the width of the last two metopes at each end of the building.

Architectural sculpture

The Archaic Gorgon of the western pediment from the Artemis Temple of Corfu, Archaeological Museum of Corfu



Classical figurative sculpture from the eastern pediment of the Parthenon, British Museum



Architectural sculpture showed a development from early Archaic examples through Severe Classical, High Classical, Late Classical and

Hellenistic.

CONCLUSION

The impact the Greeks have had on architectural design even today. As we study art history of the Renaissance, it will be very familiar in design to that of the Greeks. The Renaissance was a rebirth of Classical Greek and Roman ideas and art. As with others areas, the Art of Ancient Greece has had a large impact on Western Civilization.

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